

REMARKS

The Pending Claims and Amendments

Claims 38-48, 51-67 and 70-94 were pending prior to this response. By this amendment, new claims 95-96 have been added. Therefore, the currently pending claims are 38-48, 51-67 and 70-96. Claims 45-48, 61-63, 71, 75, 78, 82-84, and 88-90 are withdrawn from consideration.

Independent claims 38, 57, and 58 have been amended to recite "three-layer two-terminal devices" and "a single layer of semiconductor". Support for these amendments is found, for example, in the Figure 3B.

New claim 95 reciting a method of forming an LCD display has been added. Support for this amendment is found, for example, in paragraph [0027] of the patent application publication.

New claim 96 reciting "depositing all of the three layers of at least one of the plurality of two-terminal switching devices by solution-based techniques" has been added. This claim is supported, for example, in paragraph [0045] of the patent application publication.

In the Office Action, all claims were rejected. Claims 38-41, 43-44, 51-60, 64-67, 70, 72-73, 75-76, 80, and 86 were rejected under 35 U.S.C. 102(e) as anticipated by US Patent No. 6,506,438 issued to Duthaler et al. Other claims were rejected as obvious over Duthaler in view of US Patent No. 6,706,060 issued to Yu.

Applicant respectfully traverses all rejections in view of the amendments and remarks presented herein.

Applicant is grateful to the Examiner for the courtesy of telephonic interview extended to the Applicant's undersigned representatives on August 27, 2007. During the interview, the Applicant's undersigned representatives proposed to amend the independent claims to recite "three-layer two-terminal devices" and explained the advantages of using three-layer devices over multi-layer devices disclosed by Duthaler. The Examiner acknowledged that Duthaler does not disclose three-layer two-terminal devices.

102(e) Rejection based on Duthaler

The independent claims 38, 57, and 58 have been amended to recite methods for forming active matrix displays which involve forming three-layer two-terminal switching devices having a single layer of semiconductor. As it was acknowledged by the Examiner, Duthaler does not disclose forming devices with such structure.

The Applicant points out that Duthaler teaches forming five-layer devices, wherein the semiconductor portion is composed of three distinct layers, as shown in Figure 2. However, formation of such devices using printing methods is extremely complicated, if not impossible using techniques disclosed in Duthaler. Printing of patterns at the level of miniaturization required for display fabrication is associated with difficulties related to substrate wetting. For example, printing of hydrophobic inks on a hydrophilic substrate often results in decreased wetting and insufficient alignment of layers in a pattern. At the same time, printing of hydrophilic inks on a hydrophilic substrate may result in dissolution of the deposited ink within the substrate layer, and, consequently, also to decreased alignment of layers in a printed device. With larger number of layers in a device, the alignment can suffer dramatically, leading to decreased performance of control circuits, and, ultimately, to low reliability of the formed display. Duthaler appears to be unaware of this problem and proposes the use of five-layer devices. The Applicant addresses this problem by employing three-layer devices, in which printing of layers of materials, and associated layer misalignment is minimized. The Applicant submits that Duthaler fails to teach three-layer devices, fails to identify any problem with the use of five-layer devices, and provides no motivation for one of skill in the art to reduce the number of layers in a switching device and arrive to the methods of claims 38, 57, and 58.

The Applicant, therefore, respectfully requests the withdrawal of 102(e) rejection for the independent claims 38, 57, and 58 and for their dependent claims.

103(a) Rejection based on Duthaler and Yu

Dependent claims 42, 77, 79, 81, 85, 87, and 91-94 were rejected as obvious over Duthaler in view of Yu. The Applicant submits that, in view of the amendments to independent claims 38, 57, and 58, dependent claims 42, 77, 79, 81, 85, 87, and 91-94 are patentable over this combination. The Applicant points out that Duthaler provides no motivation or teaching for the use of three-layer devices in active matrix displays, while Yu is primarily concerned with the fabrication of sensor matrices. Further, Yu's devices are substantially different in that they involve unpatterned layers of semiconductor (e.g., illustrated in Figure 3B by layers 32 and 34).

In view of these remarks withdrawal of 103(e) rejection for dependent claims 38, 57, and 58 is respectfully requested.

New claims 95 and 96

New dependent claims 95 and 96 provide additional distinctions from the methods disclosed in Duthaler and Yu. For example, claim 95 recites a method for forming a Liquid Crystal Display (LCD). The Applicant notes that Duthaler specifically teaches that the use of organic materials is undesirable in fabrication of LCDs (e.g., col. 1, lines 40-57). One of skill in

the art would not be directed to contemplate LCD fabrication with the use of printable organics based on Duthaler.

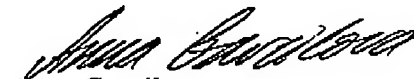
Claim 96 recites that all three layers of a three-layer two-terminal switching device are formed using a solution based technique. As it was explained, Duthaler provides only five-layer devices. Because of limitations of solution-based techniques related to substrate surface wettability, fabrication of five-layer devices exclusively by solution-based techniques is a complicated problem which is not solved by Duthaler. However, fabrication of three-layer devices, disclosed by the Applicant, entirely by solution-based methods is substantially more feasible. This is because misalignment occurring during deposition of each layer is minimized in a three-layer device compared to a five-layer device.

In view of these remarks, the Applicant submits that dependent claims 95 and 96 are patentable over cited references. Allowance for these claims is respectfully requested.

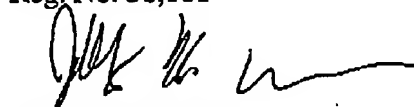
Conclusion

In view of the above, Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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